

WHAT IS CLAIMED IS:

1. A ceramic honeycomb filter comprising pluralities of porous ceramic honeycomb structures each having large numbers of flow paths partitioned by cell walls, which are connected to each other in a flow path direction, desired flow paths being sealed such that an exhaust gas passes through pores in said cell walls, the cell walls of at least one honeycomb structure being connected by plugs to those of a honeycomb structure adjacent thereto with a gap in the flow path direction, and a catalyst being carried by at least part of said cell walls and/or said plugs.
2. The ceramic honeycomb filter according to claim 1, wherein said gap is 0.1-10 mm.
3. The ceramic honeycomb filter according to claim 1 or 2, wherein said catalyst is carried by at least part of the cell walls of said porous ceramic honeycomb structure on the exhaust gas inlet side from said plugs.
4. The ceramic honeycomb filter according to any one of claims 1-3, wherein catalysts having different properties are carried by at least part of said cell walls on the exhaust gas inlet side from said plugs, and at least part of said cell walls on the exhaust gas outlet side.
5. The ceramic honeycomb filter according to any one of claims 1-4, wherein the ends of said plugs connecting pluralities of said porous ceramic honeycomb structures are located in a region 0.5 times or less as long as the total length of said ceramic honeycomb filter from the inlet end of said ceramic honeycomb filter.
6. An exhaust gas-cleaning apparatus comprising (a) a ceramic honeycomb filter comprising pluralities of porous ceramic honeycomb structures each having large numbers of flow paths partitioned by cell walls, which are connected to each other in a flow path direction, desired flow paths being sealed such that an exhaust gas passes through pores in said cell walls,

the cell walls of at least one honeycomb structure being connected by plugs to those of a honeycomb structure adjacent thereto with a gap in the flow path direction, and a catalyst being carried by at least part of said cell walls and/or said plugs, and (b) a fuel-adding means disposed upstream of said ceramic honeycomb filter.

7. A method for cleaning an exhaust gas by using a ceramic honeycomb filter having large numbers of flow paths partitioned by cell walls, through which the exhaust gas is caused to flow, the cell walls of at least one honeycomb structure in said ceramic honeycomb filter being connected by plugs to those of a honeycomb structure adjacent thereto with a gap in the flow path direction, desired flow paths being sealed, a catalyst being carried by at least part of said cell walls and/or said plugs, the method comprising adding a fuel to said exhaust gas on the upstream side of said ceramic honeycomb filter, such that plugs in said ceramic honeycomb filter, and at least part of a porous ceramic honeycomb structure on the exhaust gas outlet side from said plugs are subjected to the lower limit of a temperature activating said catalyst or higher.